Abstract

In a standard target configuration, sputtered atoms distribute in a wide angle producing a non-uniform film and poor step coverage, mainly because the flux of sputtered atoms are not collimated and the center region of the wafer experiences a higher flux of sputtered atoms than the edge of the wafer. Sputtering targets described herein are topologically and morphologically tailored such that sputtered atoms impinge directly toward a wafer in a narrow cosine distribution. In effect, the target is designed with a built-in collimator. The desired morphology and topography can be accomplished by micro (e.g., parabolic dimples) and/or macro scale (e.g., wafer contour, circular wave contour) modification of the target geometry and topography.